

Case 3075

Strongylus tetracanthus* Mehlis, 1831 (currently *Cyathostomum tetracanthum*) and *C. catinatum* Looss, 1900 (Nematoda): proposed conservation of usage by the designation of a neotype for *C. tetracanthum

L.M. Gibbons

The Royal Veterinary College, University of London, Hawkshead Lane,
North Mymms, Hatfield, Herts AL9 7TA, U.K.
(e-mail: LGibbons@rvc.ac.uk)

J.R. Lichtenfels

Biosystematics and National Parasite Collection Unit, Agricultural Research
Service, U.S. Department of Agriculture, Bldg. 1180, BARC-East, Beltsville,
Maryland 20705-2350, U.S.A. (e-mail: rlichten@lpsi.barc.usda.gov)

Abstract. The purpose of this application is to conserve the usage of the names *Cyathostomum tetracanthum* (Mehlis, 1831) and *C. catinatum* Looss, 1900 for two cyathostome nematodes (superfamily STRONGYLOIDEA) parasitic in the intestines of horses and related animals. A lectotype for *C. tetracanthum* designated by Hartwich (1986) would make this name a senior synonym of *C. catinatum*, and it is proposed that this designation be set aside; a neotype is proposed for *Strongylus tetracanthus* Mehlis, 1831 (the type species of *Cyathostomum* Molin, 1861), and the same specimen is designated as the lectotype of *Trichonema aegyptiacum* Railliet, 1900; the latter name had been established for *C. tetracanthum* as understood in modern times.

Keywords. Nomenclature; taxonomy; Nematoda; STRONGYLOIDEA; *Cyathostomum*; *Cyathostomum tetracanthum*; *Cyathostomum aegyptiacum*; *Cyathostomum catinatum*; nematodes; strongylid worms; cyathostomes; horse parasites.

1. Mehlis (1831, p. 79) established the nominal species *Strongylus tetracanthus* for nematodes parasitic in the large intestine of horses in Germany. Gurlt (1831, p. 355) gave a more extensive description of *S. tetracanthus* Mehlis, referring to large and small 'varieties' which represent adults and probable fourth stage larvae curled in the mucosa. Gurlt noted that a briefly described species *S. armatus* Rudolphi, 1802 might have been included in the material called *S. tetracanthus* by Mehlis, but he adopted the latter name and the unidentifiable *S. armatus* has not been used as a valid name for a taxon in the past 130 years.

2. Diesing (1851, p. 305) placed *Strongylus tetracanthus* in the genus *Sclerostoma* Rudolphi, 1808, and regarded *Sclerostoma quadridentatum* Dujardin, 1845 (p. 258), small strongyles of farm horses, as being the same species.

3. Wedl (1856, p. 53) renamed *Sclerostoma tetracanthum* as *S. hexacanthum*, because he saw two additional 'spines' on the anterior end and considered that this

character should be reflected in the specific name. *Sclerostoma hexacanthum* is thus a junior objective synonym of *Strongylus tetracanthum*.

4. Molin (1861, p. 453) established the genus *Cyathostomum* with *Strongylus tetracanthus* as the type species by monotypy, because he considered this species to be generically distinct from the others which Diesing (1851) had placed in *Sclerostoma*. Molin mentioned the authors mentioned above, and also had additional specimens which he referred to *C. tetracanthum*.

5. Looss (1900, pp. 156–157) recognised that the specific name *tetracanthum* Mehlis had by then been applied to several species; he used the name *Cyathostomum tetracanthum* for one (the commonest found by him in Egypt, where he was working) of these and the new name *C. catinatum* for another. Two years later (Looss, 1902, p. 124) he provided a detailed description of *C. tetracanthum* 'Mehlis partim Looss' from horses and donkeys in Egypt, although this differed in some respects from that given by Mehlis (1831). Looss (1902, p. 128) also extended his previous description of *C. catinatum*, and illustrated both this and the species he called *C. tetracanthum*.

6. Railliet (1923, p. 13) proposed that the generic name *Trichonema* Cobbold, 1874 (p. 83; based on a new nominal species *T. arcuatum*, later synonymized with *C. tetracanthum*) should be adopted instead of *Cyathostomum* Molin, 1861 because of the similarity of the latter name to *Cyathostoma* Blanchard, 1849, the name of a strongylid genus parasitic in birds. However, although the similarity of the latter two generic names (each meaning 'cup-mouthed') is unfortunate, they are not homonyms under modern Codes. Railliet (pp. 13–14) proposed that the specimens studied by Looss (1900 and 1902; see para. 5 above) should be called *Trichonema aegyptiacum* after their place of collection; the species concerned is now known not to be confined to Egypt and, like virtually all soil-transmitted nematode parasites of horses, is cosmopolitan in distribution (Lichtenfels, 1975, p. 3). In addition to horses, it has been reported from zebras and from the donkey (*Equus asinus*) in Africa and North America. Based on the descriptions of *Strongylus tetracanthus* provided by Mehlis (1831) and Gurlt (1831), Railliet concluded that *Cylicostomum insigne* Boulenger, 1917 was a junior synonym of *Trichonema tetracanthum* (Mehlis).

7. Le Roux (1924, p. 116) incorrectly declared *Strongylus tetracanthus* to be a 'nomen nudum' because the description provided by Mehlis (1831) did not allow the species to be identified unambiguously. Le Roux gave the commonly found *Cylicostomum longibursatum* Yorke & Macfie, 1918 as the type species of *Trichonema* Cobbold, 1874 and *T. aegyptiacum* Railliet, 1923 as the type species of the subgenus *Trichonema* (*Cylicostomum*); *Cylicostomum* is an alternative spelling by Railliet (1901, p. 40) of *Cylichnostomum* Looss, 1901 (p. 36). However, these designations by Le Roux are invalid; the nominal species were not originally included in the genus-group taxa concerned, and *Cylichnostomum* was published as a new replacement name (nomen novum) for *Cyathostomum* because of the latter's supposed homonymy. Cram (1924) also placed *Trichonema aegyptiacum* Railliet, 1923 in *Cylicostomum*, but used this name at generic rank. Yorke & Maplestone (1926, p. 54) synonymised *Cyathostomum* and *Trichonema*, but continued to use *Trichonema* as the valid name; they treated *T. aegyptiacum* as a synonym of *T. tetracanthum*.

8. McIntosh (1951) reintroduced *Cyathostomum* Molin, 1861 as a valid name and accepted the nominal species *S. tetracanthus* Mehlis, 1831 as the type species. While this correct typification was followed by some workers (e.g. Yamaguti, 1961; Levine,

1968; Lichtenfels, 1975 and 1980), others (e.g. Popova, 1958; Kotlán, 1960; Barus, 1962) have cited *Trichonema aegyptiacum* Railliet, 1923 as the type species.

9. Hartwich (1986, pp. 63–71) surveyed the literature on *Strongylus tetracanthus* and also studied the material in the Mehlis collection stored in the Zoologischen Museum in Berlin. Based on the classification of Lichtenfels (1975), Hartwich distinguished 10 species in the Mehlis material and suggested that to stabilize nomenclature it would be appropriate to attach the name *S. tetracanthus* to one of them. He was unable to identify specimens corresponding to the description of *Cyathostomum tetracanthum* by Looss (1900 and 1902; see para. 5 above), and called *T. aegyptiacum* by Railliet, or to those synonymised with *Cylicostomum insigne* Boulenger, 1917 or *C. longibursatum* Yorke & MacFie, 1918 by Railliet and Le Roux respectively (see paras. 6 and 7 above). Hartwich considered that stability would be least disturbed by applying the name *Cyathostomum tetracanthum* to the species described by Looss (1900) as *C. catinatum*, even though Looss had distinguished between *C. tetracanthum* and his own *C. catinatum* (para. 5 above) and provided clear descriptions of these two species. Hartwich proposed that *C. tetracanthum* sensu Looss should be called *C. aegyptiacum* (Railliet, 1923) (see para. 6 above). Hartwich designated a lectotype of *C. tetracanthum* (Mehlis, 1831) from the Mehlis material, but in the taxonomic sense of *C. catinatum* Looss, 1900. The material used by Molin (1861) when he established *Cyathostomum* is not extant, so Hartwich could not determine whether Molin had access to this taxonomic species.

10. To our knowledge only Dvoinos & Kharchenko (1994) have followed Hartwich in using the name *C. tetracanthum* in the sense of *C. catinatum*, perhaps because Hartwich's 1986 paper was published in a German museum publication with limited distribution. His action in changing the name of *C. tetracanthum* (sensu Looss) to *C. aegyptiacum* and renaming *C. catinatum* as *C. tetracanthum* has the potential to cause considerable confusion with the names of these two species. Our intention of approaching the Commission was discussed with Dr Hartwich, and he replied (pers. comm., 28 July 1997) 'With regard to your proposal to validate Looss's *C. tetracanthum*, I agree to ask the ICZN'. Our proposal was outlined at the Workshop on the *Systematics of cyathostomes of horses* held at the 16th International Conference of the World Association for the Advancement of Veterinary Parasitology (10–15 August 1997, South Africa), and the participants agreed (i) that *Cyathostomum tetracanthum* Mehlis, 1831, the type species of *Cyathostomum* Molin, 1861, should be defined in the sense of Looss (1900 and 1902; i.e. as a senior synonym of *Trichonema aegyptiacum* Railliet, 1923) and (ii) that *C. catinatum* Looss, 1900 should be retained as a valid name for a distinct species. It should be noted that veterinary interest in small strongyle nematodes is high, because of increases in the number of clinical cases and the difficulty of treatment due to resistance to the available drugs (Herd, 1990; Klei & French, 1998).

11. To achieve the aims mentioned in the previous paragraph, we propose that one of Looss's specimens of '*Cyathostomum tetracanthum* Mehlis' preserved in the U.S. National Parasite Collection in Beltsville (Maryland) should be designated as the neotype of that species (i.e. of *Strongylus tetracanthus* Mehlis, 1831). This specimen is a syntype of *Trichonema aegyptiacum* Railliet, 1923 (see para. 6 above), and we hereby designate it as the lectotype of that nominal species, the name of which will become a junior objective synonym of *C. tetracanthum*. The record of the specimen

in the National Parasite Collection has been amended as follows, in the anticipation that this application will be accepted by the Commission:- Parasite: *CYATHOSTOMUM TETRACANTHUM*. Class: NEMATODA Host: EQUUS ASINUS. Body location: COLON; CECUM Locality: AFRICA, EGYPT, CAIRO. Identifier: LOOSS, A. 5 FEB 1900 Collector: LOOSS, A. DEC 1899 Accession No.: 087757.00 Type: NEOTYPE. Storage No. MT2343F Comments: REDETERMINATION: 1 male, Neotype of *Strongylus tetracanthus* Mehlis, 1831 [= *Cyathostomum tetracanthum* of Looss, 1900]. Same male specimen is also designated lectotype of *Trichonema aegyptiacum* Railliet, 1923 [= *Cyathostomum aegyptiacum* (Railliet, 1923)].

12. The International Commission on Zoological Nomenclature is accordingly asked:

- (1) to use its plenary powers to set aside all previous fixations of type specimens for the nominal species *Strongylus tetracanthus* Mehlis, 1831 and to designate as neotype the specimen referred to in para. 11 above (U.S. National Parasite Collection, accession no. 087757.00);
- (2) to place on the Official List of Generic Names in Zoology the name *Cyathostomum* Molin, 1861 (gender: neuter), type species by monotypy *Strongylus tetracanthus* Mehlis, 1831;
- (3) to place on the Official List of Specific Names in Zoology the name *tetracanthus* Mehlis, 1861, as published in the binomen *Strongylus tetracanthus* and as defined by the neotype designated in (1) above (specific name of the type species of *Cyathostomum* Molin, 1861);
- (4) to place the following names on the Official Index of Rejected and Invalid Generic Names in Zoology:
 - (a) *Cylichnostomum* Looss, 1901 (a junior objective synonym of *Cyathostomum* Molin, 1861);
 - (b) *Cylicostomum* Railliet, 1901 (a junior objective synonym of *Cyathostomum* Molin, 1861);
- (5) to place the following names on the Official Index of Rejected and Invalid Specific Names in Zoology:
 - (a) *hexacanthum* Wedl, 1856, as published in the binomen *Sclerostoma hexacanthum* (a junior objective synonym of *Strongylus tetracanthus* Mehlis, 1831);
 - (b) *aegyptiacum* Railliet, 1923, as published in the binomen *Trichonema aegyptiacum* (a junior objective synonym of *Strongylus tetracanthus* Mehlis, 1831).

References

- Barus, V. 1962. The helminthofauna of horses in Czechoslovakia. *Ceskoslovenska Parasitologie*, 9: 15-94.
- Cobbald, T.S. 1874. Observations on rare parasites from the horse (*Trichonema arcuatum*). *Veterinarian*, 47: 81-87.
- Cram, E.B. 1924. A new nematode, *Cylindropharynx ornata*, from the zebra, with keys to related nematode parasites of the Equidae. *Journal of Agricultural Research*, 28: 661-672.
- Cram, E.B. 1925. A new genus *Cylicostomias*, and notes on other genera of the Cylicostomes of horses. *Journal of Parasitology*, 11: 229-230.
- Diesing, M. 1851. *Systema Helminthum*, vol. 2. 588 pp. Vindobonae.
- Dujardin, F. 1845. *Histoire naturelle des Helminthes ou Vers intestinaux*. 652 pp. Paris.

- Dvoinos, G.M. & Kharchenko, V.A. 1994. [*Strongylids of domestic und wild horses*]. 234 pp. Naukova Dumka, Kiev.
- Gurlt, E.F. 1831. *Lehrbuch der pathologischen Anatomie der Haus-Säugethiere. Nebst einem Anhang, welcher die Beschreibung der bei den Haus-Säugethiere vorkommenden Eingeweidwürmer enthält*. Band II und Atlas. Berlin.
- Hartwich, G. 1986. Zum Strongylus-Problem und zur Systematik der Cyathostomina (Nematoda: Strongyloidea). *Mitteilungen aus dem Zoologischen Museum in Berlin*, **1**: 61–102.
- Herd, R.P. 1990. The changing world of worms: the rise of the cyathostomes and the decline of *Strongylus vulgaris*. *Compendium on Continuing Education for the Practicing Veterinarian*, **12**: 732–734.
- Klei, T.R. & French, D.D. 1998. Small strongyles: an emerging parasite problem for horses. *Equine Practice*, **20**: 26–30.
- Kotlán, A. 1960. *Helminthologie*. Budapest.
- Le Roux, P.L. 1924. Helminths collected from equines in Edinburgh and in London. *Journal of Helminthology*, **2**: 111–134.
- Levine, N.D. 1968. *Nematode parasites of domestic animals and of man*. 477 pp. Burgess, Minneapolis.
- Lichtenfels, J.R. 1975. Helminths of domestic equids. Illustrated keys to genera and species, with emphasis on North American forms. *Proceedings of the Helminthological Society of Washington*, **42** (Special issue). 92 pp.
- Lichtenfels, J.R. 1980. Keys to genera of the superfamily Strongyloidea. No. 7. Pp. 1–41 in Anderson, R.C.A., Chabaud, A.G. & Wilmott, S. (Eds.), *CIH Keys to the nematode parasites of vertebrates*. Commonwealth Agricultural Bureaux, Farnham Royal.
- Looss, A. 1900. Notizen zur Helminthologie Egyptens. III. Die Sclerostomen der Pferde und Esel in Egypten. *Zentralblatt für Bakteriologie Parasitenkunde, Infektionskrankheiten und Hygiene*. Abteilung 1. Originale 1. **27**: 150–160, 184–192.
- Looss, A. 1902. The Sclerostomidae of horses and donkeys in Egypt. *Records of the Egyptian Government School of Medicine*, Cairo, pp. 25–139.
- McIntosh, A. 1951. The generic and trivial names of the species of nematodes parasitic in the large intestine of Equines commonly known from 1831 to 1900 as *Strongylus tetracanthus* Mehlis, 1831. *Proceedings of the Helminthological Society of Washington*, **18**: 29–35.
- Mehlis, E. 1831. Novae observationes de entozois. Auctore Dr. Fr. Chr. H. Creplin. *Isis von Oken* (Leipzig), **24**: 68–99.
- Molin, R. 1961. Il sottordine degli Acrofalli. *Memorie del Reale Istituto Veneto di Scienze, Lettere ed Arti*, **9**: 427–633.
- Popova, T.I. 1958. Strongyloidei zivotnyh i oeloveka. Trichonematidy. In: Skrjabin, K.I. (Ed.), *Osnovy Nematodologii*, vol. 7. Moscow.
- Railliet, A. 1901. [Lettre au sujet de la prétendue occurrence de l'Ankylostome duodéal chez le cheval]. *Echo Vétérinaire* (Liège), **30**(1): 38–40.
- Railliet, A. 1923. Le véritable *Strongylus tetracanthus* Mehlis et son rôle pathogène. *Annales de Parasitologie Humaine et Comparée*, **1**: 5–15.
- Wedl, L.C. 1856. Über die Mundwerkzeuge der Nematoden. *Sitzungsberichte der Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe* (Wien), **19**: 33–64.
- Yamaguti, S. 1961. The Nematodes of Vertebrates. *Systema Helminthum*, vol. 3. 1261 pp. Interscience, New York and London.
- Yorke, W. & Maplestone, P.A. 1926. *The nematode parasites of vertebrates*. 536 pp. J. & A. Churchill, London.

Comments on this case are invited for publication (subject to editing) in the *Bulletin*; they should be sent to the Executive Secretary, I.C.Z.N., c/o The Natural History Museum, Cromwell Road, London SW7 5BD, U.K. (e-mail: iczn@nhm.ac.uk).